

DRAFT
July 26, 2012

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**Subject: PEABODY MIDWEST MINING, LLC (PMM)
Bear Run Mine (Amendment 5)
U.S. Army Corps of Engineers ID No. LRL-2011-1117-gjd
Response to July 19, 2012 USEPA Public Notice Comment Letter**

On behalf of Peabody Midwest Mining, LLC (Peabody), provided are responses to the comments and recommendations submitted by U.S. Environmental Protection Agency (USEPA) regarding the above-referenced Section 404 permit application. USEPA's comments were provided via a letter to Colonel Luke Leonard of the Army Corps of Engineers, Louisville District, dated and received on July 19, 2012. Peabody is responding to these comments as part of its ongoing effort to cooperate with USEPA and USACE in connection with USACE's issuance of the Section 404 permit for the Bear Run Mine (Amendment 5) project.

Peabody maintains that the contents of the Section 404 permit application and the permit record before the USACE support the issuance of the Bear Run Mine (Amendment 5) permit. Notwithstanding this fact, Peabody has carefully considered the comments offered by USEPA on the permit application and is providing the Agency with supplemental information and responses to the questions and concerns raised by the Agency in its comment letter. As noted in the responses provided below, Peabody is also in the process of revising its permit application and supporting plans and documentation to address and resolve the issues raised by USEPA. Peabody is confident that the information provided in this letter and the corresponding proposed revisions to the Section 404 permit application for the Bear Run Mine (Amendment 5) fully respond to the issues and concerns of the Agency.

Peabody looks forward to additional dialogue with USEPA on these Section 404 permitting matters relating to the Amendment 5 project.

While Peabody is submitting this letter to further its productive engagement with USEPA on the Bear Run (Amendment 5) permit application, it is worthy to note that none of the Company's responses or proposed permit application revisions should be construed as an acknowledgement that the Section 404 permit application is inherently deficient or that the broader issues raised in USEPA's July 19th letter - most notably, the Agency's views that the project has the potential to impact aquatic resources of national importance (ARNIs) and that an Environmental Impact Statement is warranted here - are at all meritorious. To the contrary, the relevant water bodies implicated by Peabody's Bear Run Mine (Amendment 5) project are not ARNIs and the

Agency has not and cannot offer any support for its proposition that the largely ephemeral and intermittent streams to be impacted by this project constitute water bodies of such economic, aquatic and ecological significance to justify special designation as regulated ARNIs.

Peabody also takes issue with USEPA's repeat suggestion, consistent with its position on Bear Run (Amendment 4), that an Environmental Impact Statement ("EIS") should be conducted for the Amendment 5 project. The Agency remains focused on the size of the proposed project as the fundamental basis for its conclusions regarding the appropriateness of an EIS. The mere size of a project is no basis, however, for a determination of "significance" for purposes of NEPA review and a decision by USACE to proceed with an EIS. Peabody's Bear Run Mine (Amendment 5) project deals with the same regional resources and ecosystems implicated during the Amendment 4 permitting process. There, as here, the proper focus has been and must continue to be around completing the mandated NEPA Environmental Assessment and developing a mitigation strategy to ultimately support the issuance of a Finding of No Significant Impact ("FONSI") by the Corps. As set forth in Peabody's response to Agency comments, the mitigation efforts proposed by Peabody are comprehensive and remain under assessment, development and enhancement as Peabody responds to USEPA comments and finalizes its plans. Peabody has no doubt that its final mitigation proposal will once again provide a clear and defensible basis for the Corps issuance of a FONSI.

Subject to these introductory comments, Peabody directs the Agency to Peabody's responses to USEPA's comments provided below with the USEPA's comment listed first in regular print followed by Peabody's response in ***bold italics and red text***.

July 19, 2012

Enclosure 1 - Detailed EPA comments on the Section 404 Permit Application for Bear Run Mine Amendment 5

Watershed Condition & Aquatic Resources of National Importance

Modern reclamation practices may reduce some of the environmental effects of surface coal mining; however, USEPA believes there is the potential for significant harm to a landscape and its watershed to occur during the active phases of coal extraction.

Response: The site drainage plan for the Bear Run mining area is intended to address USEPA concerns regarding the potential for degradation of existing water quality in downstream waters. The operator of the Bear Run Mine will use sedimentation basins as the method for treating collected stormwater at the mine. The use of sedimentation basins is standard practice in the mining industry for treating stormwater at surface mine operations. It is the most efficient and cost effective method for reducing pollutant load in stormwater from disturbed areas. Sedimentation basins control the release of stormwater by retaining the influent drainage and detaining the drainage for a sufficient amount of time for the majority of the sediment to settle out in the pond and not be part of the discharged effluent water.

Sedimentation basins are the preferred treatment technology for sediment laden waters and have been the required technology based on studies by the USEPA when developing the effluent guidelines for coal mines. Sediment basins utilize a

passive method that controls the release of stormwater by retaining the influent drainage for a period of time allowing the majority of sediment to settle out in the basin greatly reducing sediment and associated constituents in discharging water. Sediment basins are designed to specifications that are dictated by the applicable regulatory agencies; in this case both the USEPA and IDNR, and using SEDCAD™ by Civil Software Design, LLC. SEDCAD stands for "Sediment, Erosion, Discharge by Computer Aided Design" which is specifically tailored to design and evaluate surface water, erosion, and sediment control systems for surface coal mining operations. SEDCAD is a comprehensive program that includes hydrology, hydraulics, and design and evaluation of the effectiveness of erosion and sediment control measures with respect to sediment trap efficiency and prediction of effluent sediment concentration.

In addition to the use of sedimentation basins, there are numerous good operating procedures that can be implemented and, considering site specific conditions, developed into best management practices which can be utilized to decrease sulfate and chloride concentrations in mine water discharges. These practices are employed when practicable. These good operating procedures have been thoroughly evaluated by academic specialists, coal mine regulators, environmental stakeholders, and industry stakeholders.

Best Management Practices (BMPs) that will be employed at the Bear Run Mine include:

- Reducing periods of weathering and oxidation of spoil and coal refuse with consideration given to geochemistry and temperature.*
- Contemporaneous reclamation (soil cover) as practical, to minimize spoil exposed to oxidation.*
- Compaction of coarse refuse, if needed.*
- Reduction of exposed pyrite rich materials in fine coal processing refuse circuits.*
- Water management to reduce concentrating dissolved solids constituents.*
- Geochemical characterization of coal refuse and potentially acid producing overburden.*

In conclusion, Post-mining water quality will be improved as a result of proposed mining, reclamation and mitigation and result in an overall environmental lift to area waters and land uses.

Permitted and Proposed Impacts

USEPA requested that Indiana Department of Environmental Management (IDEM) authorize discharges from the Bear Run Mine under a National Pollutant Discharge Elimination System (NPDES) individual permit because the receiving waters are impaired, and Indiana's NPDES general permit, under which the mine now discharges, does not contain water quality-based limits to protect the waters.

Response: Peabody contends that Bear Run Mine continues to comply with its Section 402 Clean Water Act NPDES permit and that it should not be placed in the middle of any EPA/IDEM dispute over the State's implementation of its Clean Water Act program. Discussions with representatives of the Indiana Department of Environmental Management (IDEM) have confirmed the Department's position that Peabody is currently complying with its Clean Water Act permitting obligations at Bear Run. In addition to documented NPDES permit compliance, IDEM has also determined through comprehensive technical review and analysis that mining operations, including Peabody's Bear Run facility, are not contributing to water quality impairments in watersheds in the vicinity of Bear Run.

IDEM's 303(d) listing documentation confirms that the constituents of concern identified by USEPA (i.e. total dissolved solids and sulfates) are not identified as impairments in any of the Bear Run watersheds. Instead, a review of IDEM's 303(d) documentation identifies the most prevalent impairment in the four watersheds around Bear Run as "impaired biotic communities." Specifically with respect to IDEM's development of the Total Maximum Daily Loads (TMDL) for the Busseron Creek watershed, the TMDL report notes the following: "The current mines in the Busseron Creek watershed are not considered significant sources of the impairments noted in this TMDL, as they are in compliance with the limits of their permits." The conclusion that the Bear Run mine is not a source of relevant impairments is consistent with the fact that impaired biotic communities are designated 303(d) impairments in over 3,000 stream segments across the State of Indiana, with only a very small percentage of such streams being associated with any mining activities.

The overwhelming prevalence of the identified impairments in Bear Run streams across Indiana suggests that any water quality concerns are associated with other prevailing regional sources and issues of concern and not Peabody's mining operations. IDEM's 303(d) and TMDL documentation makes clear that such impairments are the result of loading from unregulated, i.e., nonpoint, sources (such as agriculture, septic). Given the nature of the identified impairments, the implementation steps developed by IDEM to address these impairments do not include any recommendations to make changes in permitted sources (including Bear Run) in order to meet the TMDLs. Instead, implementation focuses on other sources; recommended controls include lime application and other projects to address impacts from abandoned mine lands, agriculture best management practices (BMPs) such as vegetated filter strips, nutrient management plans, outreach to septic owners and septic repair and maintenance, ongoing monitoring, and consideration of other BMPs as part of Sullivan County's watershed management plan.

Based on the compliance record of Bear Run under its NPDES Permit and on IDEM's evaluation of the causes of impairments in the relevant watersheds, as well as the long history of comprehensive water quality and stream and habitat assessments completed over the last number of years in connection with Bear Run permitting, it is clear that Bear Run is in full compliance with its Clean Water Act obligations and is not contributing to identified water quality impairments.

Cumulative Impacts

The 404(b)(1) Guidelines (Guidelines) require that the applicant demonstrate there are no practicable alternatives available that would have a less adverse impact on the aquatic environment for non-water dependent activities. The Guidelines presume that less damaging upland alternatives are available for these activities unless demonstrated otherwise by the applicant. The applicant must follow a sequence of steps to be in compliance with the Guidelines; which include avoidance, minimization, and compensation for unavoidable impacts.

Response: The applicant has in its Alternatives Analysis evaluated and given much thought to avoidance, minimization, and compensation for unavoidable impacts. The method of mining, location of boxcut pits, orientation of pits, location of sedimentation basins and drainage control structures and ditches, location of haul roads, location of support areas have all been evaluated and assessed so that the smallest and most efficient foot print is permitted and impacted.

The permit boundary has been restricted to the maximum extent possible to allow efficient and effective mining of the reserve. The eastern edge of the permit boundary abuts the previously approved Section 404 permit areas for the Bear Run Mine (East Pit) and the Bear Run Mine (Amendment 4) where surface coal mining and coal preparation facilities are located. Mining in the Bear Run Mine (East Pit) and the Bear Run (Amendment 4) area will advance into the proposed Amendment 5 area. The southern, northern, and western boundaries of the permit area are determined by the proposed mining plan, mineable coal boundary, land control and environmental factors. Boxcut spoil will be placed in the Bear Run (Amendment 4) area on areas previously mined and reclaimed prior to the Bear Run operations.

Large acreages of unmined land have been avoided through utilization of previously mined areas for the preparation plant, shop and offices, haul roads, plant make-up water, coal refuse disposal, boxcut spoil placement and sediment control measures. Advance disturbance will be minimized and concurrent high quality reclamation will be ongoing to keep the disturbed area to a minimum at any given time. Best Management Practices will be utilized to guard against negative impacts to the aquatic ecosystem outside of the area planned for mining. Best Management Practices include retention and monitoring of site run-off, use of quick growing cover crops, and silt fences or straw bales. In addition, temporary and permanent terracing and erosion control systems and filter strips will be employed in reclaimed agricultural fields. Stream and wetland mitigation will take place as quickly as practicable, employing the best techniques available to ensure successful mitigation. Mitigation areas will be monitored closely by well-trained staff and outside consultants will be utilized as needed (staff and consultant credentials provided in Section 5.D.)

The Bear Run (Amendment 5) project area has been selected for a number of factors that make the site unique:

Coal Quantity - this is one of the most important components of the site selection. The four coal seams to be mined by this operation on average generate 20,000 tons per acre. Most surface coal mine sites in the Midwest mine from one seam to three seams of coal. The Bear Run reserve represents one of the largest recoverable tons per acres of mineable coal in the Illinois Basin. For comparison, the Farmersburg Mine had been the largest-producing surface mine in the Illinois Basin for the past decade and averaged coal recovery of 7,800 tons per acre. To

mine the same amount of coal, one acre of disturbance at Bear Run Mine would have required 2.6 acres at the Farmersburg Mine to meet the same tonnage. Surface mining is the only available method to safely and efficiently extract the extensive available coal reserve and prevent future impacts. The unique features of the Bear Run coal reserve are discussed further in Part D of the Alternatives Analysis.

Property and Mineral Control - surface property and coal reserves were acquired at a substantial cost. It is not economically feasible to relocate this site to an uncontrolled area even if an acceptable reserve was available. The lost time and additional investment with an unknown conclusion eliminate this as an option from a practical business perspective. Property control/access must be acquired before aquatic resources can be evaluated.

Existing Land Use and Site Location - land uses are primarily cropland, forest and previously mined areas. Topography is flat to rolling. The site occurs in a rural, sparsely populated setting and is isolated from most nearby residences. Existing land uses on previously-mined areas at the site have a long history of successful reclamation and reestablishment of post-mining land uses. Previously affected areas are being utilized to the largest extent possible for mining support facilities in order to avoid and minimize additional impacts to unmined lands.

Coal Quality - the coal seams to be mined by this operation are the Indiana 7-Coal, 6-Coal, 5A-Coal, and 5-Coal. These are needed, compatible fuel sources for existing coal-fired power plants which must continue to operate and produce electricity that is crucial to the economy and security of the United States. The average BTU content of the final saleable coal is ~11,000. While alternate sources of power generation are being developed on varying scale throughout the country, there is no viable, scalable, or economic replacement for coal in the foreseeable future.

Marketability - the site location allows for efficient access to existing infrastructure that currently supports transportation of coal to customers for energy production. The Indiana Rail Road Company completed a rail spur into the Bear Run site that provides access to rail lines which are located strategically to coal-fired electric utilities. Rail delivery will be the primary method of delivery of coal to the mine's customers, thereby reducing potential traffic onto local public roads.

Mining Ratio - In addition to the uncommonly high coal tons per acre at Bear Run, another unique aspect is the depth and distribution of the coal seams and the resulting mining ratio. Based on historical data and the current coal market, Peabody's Midwest Operations employ an average 20:1 mining ratio as its' basis for whether a reserve can be economically mined from a surface operation standpoint. The mining ratio is a calculation of overburden (both consolidated and unconsolidated above a coal seam) moved per clean ton of coal produced. The higher the mining ratio (or more overburden moved per clean coal ton), the higher the cost of producing coal. At locations like Bear Run, where multiple seams will be mined, the recoverable coal volume is factored together to lower the overall mining ratio for the entire coal reserve. The ratios of the Bear Run Mine (Amendment 5) reserve calculated from the surface to each seam is as follows:

<i>Bear Run Mine (Amendment 5) Mining Ratios</i>	
<i>Indiana 7-Coal seam</i>	<i>46:1</i>
<i>Indiana 6-Coal seam</i>	<i>26:1</i>
<i>Indiana 5A-Coal seam</i>	<i>24:1</i>
<i>Indiana 5-Coal seam</i>	<i>18:1</i>

All 4 seams must be mined in order to be economically feasible. This fact coupled with the high depth to the lowest seam causes avoidance of aquatic resources to be unfeasible. The only manner in which this mine can operate efficiently and safely is to open a pit once and advance consistently to the end of the mining.

Economic Impact - Based on 2016 financial data, the Bear Run Mine will have a total estimated sales impact of \$950,000,000 a total estimated wages and benefits impact of \$170,000,000 and a total estimated employment impact of 1,781 jobs on the Sullivan County area economy. Peabody also is estimated to pay local property taxes totaling approximately \$4,000,000 in 2016 (source Harding, Shymanski & Company, PSC, 2011). This analysis is included in the application.

Status of Reclamation at Bear Run East Pit and Bear Run Amendment 4 & Reconnection of Aquatic Resources to the Watersheds

Pit sequencing map(s) should be provided for the permitted and proposed portions of the Bear Run Mine that illustrate a timeframe for aquatic resources impacts and accompanying information on reconstruction and reconnection of watersheds to downstream waterbodies. Further, as Amendment 5 modifies the previous mine plan it should be determined if the new plan changes the regarding and stream restoration on the current Amendment 4 permit.

Response: Pit sequencing maps have not been required for any of Peabody's previous permit applications. As outlined in other areas of this response, Peabody needs to maintain flexibility in the mining and reclamation process. The current mining taking place on the eastern portion of the approved permits includes extensive box cut operations. These activities are not indicative of on-going mining and reclamation once mining normalizes. Peabody does not feel specific maps would be productive as revisions would be needed and unlike SMCRA, the 404 process does not include practical revision processes necessary for coal mining. SMCRA does mandate contemporaneous reclamation for surface mining to maintain desirable reclamation progress. Furthermore, it is in Peabody's financial interest to keep reclamation and mitigation as close and concurrent as possible. Peabody is reviewing potential timeframes between disturbance and reconstruction. One possibility is to estimate the amount of time it takes to re-establish stream channels from the time the channel is removed by pit advancement. Flexibility would be needed for unknown production variations, weather conditions during the construction season, and other factors. Peabody is reviewing this option to provide additional estimates of timing.

Avoidance and Minimization

The application should present a reasonable range of alternatives that avoid and minimize impacts to aquatic resources onsite. USEPA recommends that these alternatives include but are not limited to the changing of pit orientation, shortening of pit lengths and inclusion of alternative mining methods. In addition, proposed impacts to 59,524 linear feet of stream are from non-extractive activities. The applicant should identify a reasonable range of practicable alternatives that explore methods for avoiding and minimizing impacts to aquatic resources, especially from these non-extractive activities that are associated with mining operations.

Response: Peabody believes it has fully addressed alternatives in its application and within this response, consistent with its previously approved 404 applications. Peabody carefully considered practicable mining plans that meet the project purpose of maximizing coal recovery while minimizing disturbance to unmined areas. Permit boundaries were developed based on the need to minimize impacts. Besides environmental impacts, Peabody has other economic incentives to minimize its footprint as land and reclamation are expensive. Nevertheless, Peabody will review its alternatives analysis in an effort to identify any additional reasonable and practicable alternatives and revise if appropriate. More detail is provided in following responses to specific comments.

Detailed comments on the Section 404 permit application

Baseline Information

- Page 14 of the application identifies the water quality data that will be collected from specific sites to further characterize water quality before and after mitigation. USEPA recommends that Peabody also measure sulfates and DO, for these points since they are known impairments to a portion of the watersheds they propose to affect. Further, USEPA recommends that these parameters be combined with the biological sampling to provide water quality and biological data during and post mining. This effort should include the implementation of corrective actions if the data shows negative trends in water quality and constituents of the biological community.

Response: The surface water sampling plan detailed on page 14 of the Section 404 permit narrative is consistent with recently approved permits and includes the key parameters necessary for assessing and evaluation water quality prior to, during, and after surface mining activity; particularly that associated with impacts and mitigation of streams and wetlands on and adjacent to the permit area. As discussed later in this letter, there are no stream impairments for sulfate listed in the public noticed Draft 2012 List of Impaired Waters and Consolidated Assessment and Listing Methodology for waters within or adjacent to this permit area. With regard to Dissolved Oxygen (DO), there is one stream segment of Maria Creek listed in the 2012 Draft 303(d) List of Impaired Waters and this segment interestingly receives drainage from area undisturbed by mining and most likely the impairments are due to septic systems, livestock, and agriculture. The eastern most tributary of Maria Creek that does receive drainage from previous surface mining is not listed for any impairment. The Adaptive Management Plan included in the current permit application will be revised to include general water quality as a factor when assessing mitigation success.

- The total acreage of riparian buffers would be reduced by 120 acres from pre to post mining according to the Woody Riparian Buffer table on page 61 of the application. Based on this information, it is not clear how Peabody is actually increasing riparian buffer as stated in the application. USEPA requests that Peabody clarify this inconsistency.

Response: On page 61 of the permit narrative, the word "increase" has been changed to "enhance". On the Woody Riparian Buffer table, there is a shown increase in riparian buffer for the intermittent and perennial stream mitigation, while the ephemeral does show a decrease. The main reason for the perceived decrease is for the initial stream assessments, all riparian buffers were evaluated out a distance of 100 feet on each side or to the watershed break regardless of stream flow regime. While the ephemeral riparian buffer mitigation seems a decrease, additional forested plantings will be placed contiguous to these riparian buffers to satisfy the Indiana Department of Natural Resources requirement for no or minimal loss of forest in the SMCRA permit. The USFWS comments on this permit suggest strategic placement of upland acres adjacent to riparian buffers and Peabody will incorporate this suggestion. Peabody is also willing to increase the riparian buffer widths on ephemeral streams and intermittent streams by 10%. Also, please note Peabody has had discussions with the appropriate representatives at Indiana State University and plans to include suitable habitat for crawfish frog in its' reclamation plan, as suggested by USFWS and Indiana DNR.

- As detailed on page 12, Buttermilk Creek is listed by the State of Indiana as impaired for sulfates, Middle Fork Creek is listed for low dissolved oxygen (DO), E. coli, and impaired biotic communities, Black Creek-Brewer Ditch is listed as impaired by the State of Indiana for sulfates and impaired biotic communities and TDS. Additionally, the current Total Maximum Daily Load Report for the Busseron Creek Watershed identifies the Bear Run Mine and Farmersburg Mine to the North as potential sources of TSS, pH and metals in the Busseron Creek Watershed.¹¹

Response: Page 12 of the 404 permit narrative lists impairments that were included in the Draft Indiana 303(d) List of Impaired Waters. Since then changes have been made to reflect current water quality standards per the Draft 2012 List of Impaired Waters and Consolidated Assessment and Listing Methodology as public noticed on February 9, 2012. Per that document the following impairments are listed for receiving waters in and adjacent to the Bear Run Mine.

Stream
Buttermilk Creek

Impairment
Impaired Biotic Community

Maria Creek

Impaired Biotic Community
Dissolved Oxygen
E. coli Bacteria

With regard to Biotic Impairments to Aquatic Communities, this is the most prevalent impairment to stream segments (more than 3,000) in Indiana and occurs throughout the state in many areas not associated with coal mining. An Impaired Biotic Community (IBC) listing on Indiana's 303(d) list, means IDEM's monitoring data shows one or both of the aquatic fish or invertebrate communities are not as healthy as they should be. Although listed as impairment, IDEM states that IBC is not a source of impairment but a symptom of other sources. USEPA has apparently made the assumption that biotic community impairment is due to water quality impacts and not the loss of habitat by stream channelization and clearing for agriculture. This type of habitat loss is recognized by the applicant and the USACE and a comprehensive stream mitigation project is now ongoing on Buttermilk Creek as part of the approved Bear Run Mine (Amendment 4) Section 404 permit to restore flow through the original channel, restore in-stream structure and natural stream design and establish critical biological habitat in the stream and adjacent wetlands.

It should also be noted that only the western most headwater tributary of Maria Creek is listed as impaired. This segment receives drainage from area undisturbed by mining and most likely the impairments are due to septic systems, livestock, and agriculture. The eastern most tributary that does receive drainage from previous surface mining is not listed for any impairment.

Regarding USEPA's statement that the public review Draft Busseron Creek Watershed Total Maximum Daily Load (TMDL) Development identifies the Farmersburg and Bear Run Mines as potential sources of Total Suspended Solids, pH and metals in the Busseron Creek Watershed, it should be noted that both mines are permitted discharges with approved established effluent limits which have been accounted for in the TMDL waste load allocation consistent with the Clean Water Act. The TMDL Development report lists only Total Suspended Solids and iron as potential constituents and does not include pH or other metals. Total suspended solids contributions will be negligible from the mining area compared to loadings input from agricultural areas.

Operations and Reclamation

Peabody's Operation Map and Reclamation Plans are inconsistent with each other. The comments below summarize USEPA's concerns with these plans.

- SMCRA drawings indicate "Box Cut Disposal" to the east of each initial cut. This does not appear to be correct, as Amendment 5 is for the western extension of a previously permitted area, and these disposal areas are the mined-out pits from the previous cut.

Response: Peabody does not fully understand this comment. The boxcut spoil disposal areas shown on the SMCRA Operations Map are consistent with the plan of Amendment 4 which utilizes the current mining area,

previous mined out pits and pre-Bear Run reclamation areas for spoil disposal. Utilization of these areas reduces the overall footprint of the mine and minimizes disturbance to unmined area. It is correct that mining within Amendment 5 is a continuation of mining from Amendments 1, 2, 3, and 4. The only additional box cut placement is at the north and south ends of Amendment 5 and will accommodate pit extensions.

- The existing mining operation on Amendment 4 has the dragline pits orientated east- west. While Amendment 5 illustrates that the pits are aligned north - south. There is no discussion as to why the previous orientation is not being continued with the new mining. The north- south orientation creates longer pits that intersect the drainage paths that flow predominantly from the northeast to the southwest. This would mean that the stream continuum will be interrupted for the entire period of mining and during reclamation. USEPA requests that Peabody presents an alternative analysis which includes but is not limited to an operations plan with an east-west pit orientation.

Response: The existing mining operation on Amendment 4 has the dragline pits oriented from north - south advancing westward. This is the case in both the north and south mining areas and has not changed. The initial mining in the north area within Amendments 1, 2, and 3 was oriented east-west advancing southward. This plan was developed to utilize existing pits while maximizing coal recovery and minimizing impacts to non mining areas. The coal further south has already been mined; therefore, the box cut to develop the north-south oriented pit is being developed as originally planned in each Bear Run SMCRA and 404 permit. The pit orientation plans have not changed. Please note the Amendment 4 Section 404 permit discusses future mining would occur west of the permitted areas and pits would advance from these areas into the future areas. Also, as discussed in the previous Section 404 permits and the current pending application, the Bear Run Mine consists of 4 separate seams with a mining depth ranging from 250-300 feet. Pit lengths are critical to operating a safe and efficient mining operation that produces consistent tonnage, workforce needs, equipment needs, and consistent deliveries to the customer.

Considering the needed pit length and many other factors outlined in this response, an east - west orientation may disturb less stream length of a given stream on an annual basis, but it would also result in disturbance to multiple streams and watersheds at the same time with the pit advancement and clean water diversions that would reroute drainage around the advancing pit. In addition, box cut spoil areas would have to be created inside the proposed mining area causing surface disturbance while sterilizing significant mineable coal. Peabody disagrees with the statement the stream continuum would be disrupted during the entire period of mining and reclamation in a north-south orientation. Incremental pit advancement and concurrent reclamation would occur regardless of orientation.

- There is no discussion of the shortening of pit lengths to avoid water resources. This should be included in any discussion of alternatives

regardless of pit orientation. USEPA requests Peabody evaluate areas of avoidance by shorting pits lengths.

Response: As discussed in the previous response above, pit length is crucial to operating a safe and efficient pit at Bear Run. In addition, the current layout represents the best practicable plan the meets the project purpose when considering cost, technical, environmental and logistic factors. The plan maximizes coal recovery from a reserve that provides a high volume of coal from each acre of surface disturbance. Shortening pits would not result in avoidance of any special aquatic response. If coal is left in place at Bear Run, it will eventually be replaced by coal at another location where the impacts could be greater. Also, the current plan provides for strategic tie in of mitigation at public road crossing in most areas, which is preferable to reconnecting at an existing entrenched location. This form of mitigation is preferred by the natural stream restoration experts consulted by Peabody.

- There is no discussion about starting the mining at the western boundary and then mining to the east. This approach would allow faster reclamation of stream form and function. USEPA requests Peabody provide a rational for not choosing this approach.

Response: The original and current plan at Bear Run is to mine north - south oriented pits from the east side of the reserve to the west side of the reserve as laid out in previous permits. The mine infrastructure, support facilities, and land acquisition plans have been established based upon this plan. The opening and advancement of these pits are well underway with significant investment already incurred by Peabody. If pits were opened on the west side of the permit it would result in many negative consequences. Additional box cut pits would have to be incurred. The north mining area along would generate in excess of 40 million cubic yards of material that would have to be placed. This material would be placed on the western portion of the permit, disturbing a very large portion of land while preventing planned coal extraction. Development of these pits would not allow Peabody to meet its coal production and delivery obligations. Furthermore, additional disturbance would be necessary to construct haulroads and drainage control structures to allow coal haulage back to the processing area. This approach would lead to increased temporal loss, increased land disturbance, and significant loss of coal reserve. Peabody does not agree this approach would allow faster reclamation of stream form and function. The opening of new pits would delay reclamation and essentially the same or more aquatic resources would be disturbed annually once pit advancement normalizes. Basically, the same open pit configuration would be utilized mining up stream; however, more clean water diversions would likely be needed to divert run off from entering the advancing pit to ensure a safe and driest possible pit that minimizes water contact with the open pit materials.

- Sediment control structures have been proposed within the stream channel, such as SB067. The 404 application does not explain why the applicant believes sediment control features need to be located in the channel as the existing topography would easily allow the structure to be excavated outside of jurisdictional waters. USEPA requests Peabody remove the sediment control

structure from the stream channel.

Response: Peabody has located SB067 as close to the coal removal area as possible to minimize disturbance on non-mining areas and to avoid additional disturbance downstream. This is the best practice when considering all mining, drainage control, and reclamation obligations. Locating the basin immediately adjacent to the mining area provides constant, effective drainage control for NPDES compliance, as opposed to a mine through and replace scenario. Also, the existing topography does not allow the structure to easily be constructed outside of the jurisdictional waters. The topography shows the excavation would need to occur through the unconsolidated material and into consolidated rock in order to create the necessary compliance volume while reaching the needed pool elevation to receive run off from the watershed. Also, Peabody believes the best plan for completing mitigation would be to connect the upstream mitigation to existing bridge at County Road 1100 south, as opposed to a connection to the existing narrow floodplain or entrenched stream 500 feet further north. Photos taken 07/23/12 from the bridge at CR 1100 south looking north and looking south are provided below.



Photo 1: At CR 1100 South Bridge looking north at proposed location of SB067

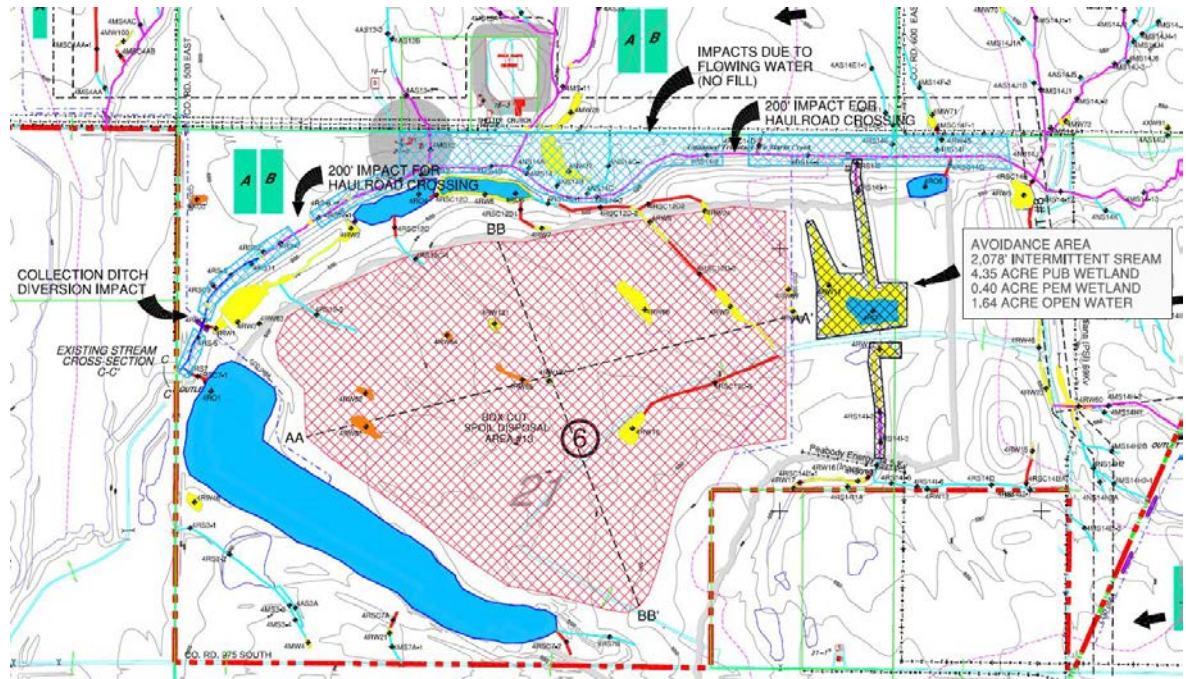


Photo 2: At CR 1100 South Bridge looking south downstream of SB067 and the Amendment 5 permit boundary.

- The 404 application is unclear about the need for some areas to have been included with the permit boundary. These areas are located in the southern half of the proposed expansion, and include impacts to water resources and proposed mitigation despite the fact that the SMCRA application does not indicate any mining will take place. This is very noticeable in the SW area of the permit area south of County Road 900 South. There is no mining proposed in this previously mined area and no indication that the existing final pit impoundment is to be backfilled. The only evidence of proposed earthwork is the elimination of the impoundment on the Mitigation Map. This area also has a perennial stream identified for impact and mitigation. Please see Attachment 3 North Operations Map and Attachment 4 South Operations Map. It is not clear why Peabody impacted the resources in this area. Peabody needs to clarify these inconsistencies.

Response: The south area (containing SB067) is included for coal extraction purposes. This is clearly shown on the SMCRA Operations Map. The area in the southwest (containing SB068) includes previously mined land that is included for potential spoil disposal for pit extensions or to place excess spoil. The SMCRA Operations Map will be updated to illustrate this use. This area is also needed for other support functions such as sediment basins. Utilization of SB068 allows Peabody to avoid disturbance to additional non mining sites and minimizes advance disturbance within the watershed. There are no plans to fill this impoundment. It is necessary to utilize the east-west running stream just south of CR 900S to convey water to SB068 through a diversion and 2 stream crossings for access. Peabody can commit to no additional excavation in this stream corridor and avoid for non water flow purposes. The stream crossing locations have been selected to minimize aquatic impacts. Also, Peabody can commit to avoidance of the larger wetland on the east side of this tract. These

conditions are illustrated below. In terms of the perennial stream segment, Peabody believes this was incorrectly characterized by its' consultant as it was not flowing during a field visit on 07/23/12. A photo from the downstream crossing at CR 500E is shown below. The perennial segment more likely may begin at the point where the final cut impoundment discharges into the stream.



The southeast area (containing SB065) is needed for sediment control purposes as upstream impoundment volume was planned for spoil disposal. Peabody has reassessed this part of its drainage control plan and believes it can commit to avoiding this area. Additional redesign is underway and confirmation should be forthcoming.

- Neither the SMCRA nor 404 applications include any detailed post mining topography. Without this detail it is not possible to determine the gradient of each proposed stream reconstruction or the post mining drainage boundaries. Please provide a post mining contour map.

Response: Peabody has not provided a detailed post mining contour map in any of its previous Section 404 permit applications at Bear Run or other sites and does not believe it is appropriate for several reasons. At the urging of the USACE and USEPA, Peabody has attempted to advance its permit applications further in advance of mining than it had in the past. As such, this application includes currently uncontrolled properties, which Peabody will be attempting to secure, but the final control is not yet known. Final contours will have to be developed as mining advances, road closures are secured, etc. Peabody is committing to the mitigation plan outlined in its application that provides for the appropriate length, type, watershed and topographical setting for stream and wetland mitigation. The SMCRA permitting program allows such on-going revisions as properties are

acquired and plans updated. A detailed post mine topography plan would not be productive at this time and would create the need for numerous future revisions if incorporated into the permit. Peabody must maintain flexibility to adjust topography as necessary, but has made the commitment in the permit application for the appropriate restoration criteria as it has done in its previous Section 404 applications. Peabody will, however, commit to providing updated topography plans to the USACE in conjunction with SMCRA updates. Please note these factors also affect final mitigation locations and adjustments to locations will be necessary in the future, but mitigation quality will not be compromised.

The floodplains of the primary stream corridors will be tied into existing elevations at the downstream control points and will generally be constructed at pre-mine elevations or slightly higher. If an upstream control point is also present, then the channel elevations will be controlled by the upstream and downstream control points. The topography in between the primary stream corridors will be raised to accommodate on-going swell. The required reclamation of cropland areas will be located along the elevated ridges in between the primary stream corridors.

The following table is included in the permit application and lists the types of channels that will be used in mitigation where the specific type will be dependent on the reclaimed slope of the stream.

Rosgen Channel Morphology Matrix									
Stream Type		A		B		C		E	
Bed Material and Designation	Silt-Clay	(6)	Silt-Clay	(6)	Silt-Clay	(6)	Silt-Clay	(6)	
	Sand	(5)	Sand	(5)	Sand	(5)	Sand	(5)	
	Gravel	(4)	Gravel	(4)	Gravel	(4)	Gravel	(4)	
Entrenchment Ratio		<1.4		1.4-2.2		>2.2		>2.2	
Width/Depth Ratio		<12		>12		>12		<12	
Sinuosity		1.0-1.2		>1.2		>1.2		>1.5	
Slope (percent)		4-10		2 -3.9		<2		<2	

- In the cross-sections, "Pre-Post Mine Topography Cross-Section D-D', E-E', F- F'", the original ground surface appears to be raised by exactly 30 feet in the post mining contours. This proposal creates a final ground surface that would mirror the original surface at a higher elevation. This elevation difference could create an issue blending the existing topography to the offsite elevations and at areas within the mine limits that are avoided and connecting proposed mitigation to their upstream and downstream waters at the completion of reclamation. USEPA requests Peabody to document how the post mining contours will blend with existing contours and unmined areas.

Response: The referenced cross-sections included in the SMCRA permit are intended to be representative of the overall increase in elevation based on expected swell. As discussed previously, post mine topography is updated periodically within Approximate Original Contour parameters given the specific mining conditions. Peabody will update the cross-sections to more accurately represent post mine topography. In terms of blending, this is a

requirement within all SMCRA permits. Blending will be completed to properly connect to all upstream and downstream drainage control points, as well as, properly reclaiming non water features along the disturbance boundary. Utilization of spoil disposal areas during the initial box cut(s) will enable this to be accomplished throughout the mining area of Amendment 5.

At the control points where stream mitigation will be tied into existing streams off the permit area, the stream valley will be graded to an appropriate slope for the proposed stream type to be constructed. "A" type and "B" type channel configurations may be employed as needed. At the transitional zones between the natural design mitigation and existing tie-in streams, grade control structures will also be incorporated into the proposed channel to maintain stream stability. Grade control will be provided by the installation of cross vanes, step pools, or rock sills at appropriate locations to prevent any destabilizing effects from propagating into the natural design restored reaches. Depending on the change of bed elevation required, a single or series of structures may be employed.

- The proposed mitigation streams and wetlands, shown in "Bear Run Mine (Amendment 5) Mitigation Map, Map C" appear to differ in some cases from the location and extent of the original streams and topography. Also it appears that some of the proposed mitigation will encroach on several protected buffer zones. It is not clear why Peabody would include water resources in their impact totals that flow through or originate in unmined areas. Peabody should address these inconsistencies.

Response: As discussed previously, Peabody's plan is to acquire all additional properties including residences throughout the permit area prior to mine advancement reaching these locations. SMCRA allows this incremental approach and commonly processes such revisions in a short period of time. If any of these properties are not acquired, then the buffers will remain intact and will not be disturbed. If these buffer areas contain aquatic resources, then the upstream or downstream elevation will become control points for mitigation. Peabody will adjust the proposed mitigation locations to avoid mitigation being shown in current buffer areas. Please note the SMCRA and 404 applications were completed approximately 1 year ago. Peabody will update the buffers to reflect current conditions. For impact totals, Peabody commonly includes impacts on properties that it plans to mine regardless of current control status. The landowners within Amendment 5 provided permission to allow proper assessment of their property, which indicates future acquisition is likely.

- The SMCRA application indicates buffer zones around various properties and cemeteries within the proposed mining area. It is not clear if these controlling structures have been reflected in the post mining topography or what impact they might have on the stream reconstruction. Peabody should specifically identify these features on the post mining contour and mitigation map.

Response: Any drainage control points will be considered in the post mine topography plan and will be blended appropriately. Peabody intends to pursue relocation of small abandoned cemeteries if the proper consents and approvals are obtained as required by Indiana law. Typically, abandoned cemetery plots are relocated to larger cemeteries where appropriate care and maintenance is provided. Other cemeteries will be mined around and reclaimed as previously discussed.

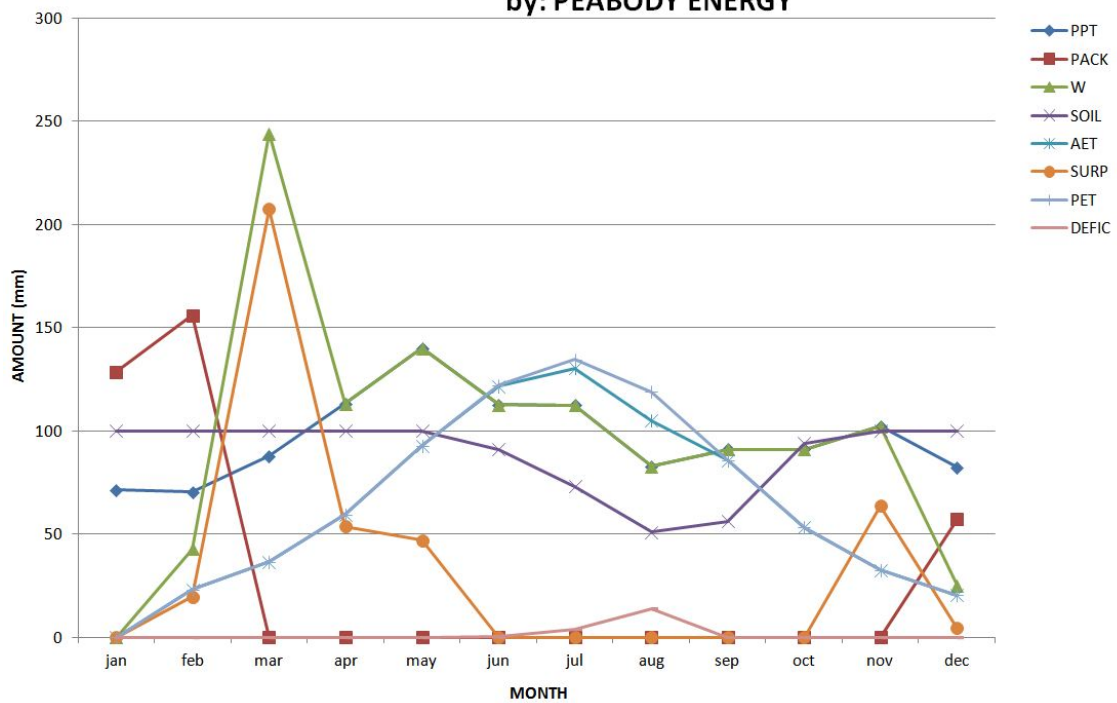
- Many of the proposed mitigation streams are identified as intermittent. It is unclear how the groundwater component will be effectively restored for these streams. There is no discussion about high compaction zones or ways in which to perch a water table in order to feed the streams. Peabody should address how the proposed flow regime will be achieved on the mitigation streams.

Response: It is important to understand the existing condition of the on-site streams characterized as intermittent. Many of the intermittent streams are present in small watersheds that only have flows slightly longer than precipitation events, the range for flow from existing intermittent streams is quite wide. Also, there are many existing features present on site that contribute to intermittent flows that are not ground water based. Examples include the man-made flood control structures present in the north mining area of Amendment 5. These structures store tremendous volumes of water that lead to extended downstream flows. These structures have also lead to the creation of the largest wetland tracts within the permit. These positives should be considered when determining the value of routing postmine streams through water impoundments. Other in-stream impoundments, public road crossings and various structures also create extended surface water flow. Other intermittent streams are the result of years of erosion where the stream bottom has now intersected ground water sources.

The intermittent flow regime will be achieved through the reestablishment of groundwater recharge. To model groundwater recharge, a Thornwaite-Type Monthly Water-Balance Model was generated that analyzes the allocation of water among various components of the hydrologic system. Inputs to the model are monthly temperature and precipitation. Outputs include available water, potential and actual evapotranspiration, soil moisture storage, snow storage, and surplus. Precipitation and temperature averages were obtained from weather data recorded for Sullivan, Indiana which is adjacent to the Bear Run Mine. Additionally, an average soil-moisture storage capacity of 100 mm was used in the model.

The following illustrates the average distribution of precipitation, soil moisture, evapotranspiration, and net precipitation throughout an average year for the Bear Run Mine.

ANNUAL WATER BALANCE FOR BEAR RUN MINE, SULLIVAN CO., IN by: PEABODY ENERGY



Where the following variables are:

PPT	=	Precipitation
PACK	=	Snow Pack
W	=	Water Input to the System
SOIL	=	Soil-Moisture Storage Capacity
AET	=	Actual Evapotranspiration
SURP	=	Runoff and Recharge
PET	=	Potential Evapotranspiration
DEFIC	=	Climatic Water Deficit

The distribution of recharge and runoff shown above are consistent with the appearance of the wetlands and surface runoff in the project area. The majority of the precipitation falls between May and September, which also corresponds to the maximum evapotranspiration. The maximum soil moisture occurs during the winter months when the majority of the plants go dormant. There is actually a water balance deficit during the summer months between June and October when evapotranspiration exceeds precipitation. This can be witnessed by the drying up of many small wetlands and intermittent streams during the summer.

Post-mining groundwater recharge is affected by several factors including the climate, recharge and discharge rates, porosity, topography, and geologic structure. With precipitation and temperature vary slightly year to year, groundwater recharge is most affected by the fracturing and removal of stratified overburden (both unconsolidated and bedrock) and replacement with spoil (the fractured overburden) that is highly heterogeneous and anisotropic. Immediately after reclamation, porosity and vertical permeability will be increased with significant resaturation of

the spoil. The factors that contribute to this increase in post-mining groundwater recharge are:

- Immature vegetation establishment, which reduces evapotranspiration and increases runoff and recharge,*
- cover vegetation species have more shallow root systems which requires less soil moisture storage allowing water to recharge groundwater,*
- increased porosity and permeability of the vadose zone which allows more storage opportunities and more rapid movement of the water, respectively, to recharge the groundwater,*
- construction of open water impoundments increases recharge by reducing surface runoff and increasing seepage to groundwater,*
- and fracturing of lower permeability consolidated bedrock and overburden.*

As the spoil has become saturated and the groundwater table stabilizes, the topography will influence the groundwater flow in the spoil and ultimate release into the stream mitigation placed down gradient. Wetland mitigation adjacent to the stream mitigation will also provide groundwater recharge promoting intermittent flow through the Bear Run site.

- Neither the SMCRA nor 404 applications address the issue of the final pit backfilling or a change to a permanent impoundment. If the final pit is to be backfilled then the source of the backfill material should be identified. The SMCRA drawing indicates a pond (SB079) but this is not reflected in the Mitigation Map. Please address this inconsistency.

Response: SMCRA regulations do not allow a change in land use from what currently exists without landowner consent and agreement with other requirements. Due to the land acquisition status discussed in other parts of this response, final pit impoundments are not yet shown in their final planned locations. Peabody will update both the SMCRA and 404 applications to show final pit impoundment locations based on current land control status.

- The SMCRA application identifies two open water features that will not be reclaimed. However, these open water features are located directly in proposed stream and wetland mitigation areas. Peabody must either revise the on-site mitigation plan to include these water features or explain where the material will come from to backfill them.

Response: See above response. Peabody will update the applications to be consistent and address these 2 impoundments in conjunction with the update described above. Peabody intends to replace these impoundments in their approximate locations to prevent increased downstream flood potential. It should be noted that these two existing flood control lakes generated the largest wetland blocks delineated within Amendment 5 and

previous Bear Run amendments. The two wetland complexes total 33.92 acres or 23.1% of the total wetlands delineated in Amendment 5 alone.

Mitigation Plan

Currently, the mitigation plan for the proposed project does not appear to contain all the requirements set forth in the 2008 Compensatory Mitigation Rule. USEPA's concerns on mitigation include the work plan, performance standards, monitoring and financial assurances (as per 40 CFR 230.94). In assisting in the effort we offer the following comments in regard to the proposed mitigation plan:

Onsite Mitigation Plan

- Peabody is proposing Rosgen "E" type channels for a portion of the mitigation. It is unclear which reconstructed channels would be constructed as "E" type.

Response: Rosgen "E" type channels will be constructed in floodplain valleys with slopes less than 2%. These highly sinuous streams (>1.5) which have low channel width/depth ratios will be used where post-mining land uses and post-mine topography allow. As explained in the conference call with USEPA on 07/19/12, "E" type channels are not entrenched.

- Page 23 of the 404 application indicates that stream and wetland mitigation will take place as quickly as practicable, employing the best techniques available to ensure successful mitigation. Peabody should identify what it considers to be practicable, and include more detail regarding the conditions that must be met prior to construction of the mitigation streams and wetlands and the subsequent reconnection of the mitigated resources to downstream watersheds. Further, to understand the mitigation construction sequence, USEPA requests a general mitigation timeline tied to the operations plan.

Response: As outlined in other areas of this response, Peabody needs to maintain flexibility in the mining and reclamation process. The current mining taking place on the eastern portion of the approved permits includes extensive box cut operations. These activities are not indicative of on-going mining and reclamation once mining normalizes. Please see other parts of this response for further clarification.

- Given the large number of ephemeral natural streams impacted and the stated overall reduction in riparian buffer proposed for mitigated ephemeral streams, USEPA feels it is more appropriate to mitigate these streams at a 1:1 ratio.

Response: The proposed ratio for the ephemeral stream mitigation (0.5:1) is consistent with past approved Section 404 permits and is justified with the enhancements described in the permit application. The ephemeral streams will be replaced with a natural design channel that will include an enhanced riparian buffer (55-foot on each side with predominately hard-

most tree species), reduced entrenchment, and engineered structure placement for stability and aquatic habitat. The streams will be constructed with bankfull channels appropriately sized for the reclaimed watershed. These added enhancements provide a lift in stream functionality and value and compensates for any lost ephemeral stream length. Also, note most ephemeral and many low grade intermittent streams in the Midwest are merely erosional features. Peabody believes not replacing these type streams on a foot by foot basis is the best long term plan for the watersheds. Considering the large influence of agricultural lands in this permit and in Indiana, Peabody believes it will be more beneficial to the environment to further reduce the ephemeral length and replace the impacts with additional wetlands adjacent to the primary stream corridors. This will allow better flood control and water filtering as flow continues downstream while allowing more effective erosion control features to be utilized to regulate flow from reclaimed agricultural areas. Peabody believes this type of plan should be given proper consideration.

- Peabody should clarify what "mixed" land use is, as the majority of impacts are proposed in areas identified as such.

Response: Land use descriptions have been added to the permit narrative for clarification. A "mixed" land use denotes the resource (stream, wetland, or open water) has been indirectly or directly impacted by adjacent agricultural activities such as a reduction in riparian buffers resulting in excess sediment deposition or for resources that have been pushed or maintained at a farm field-forest boundary.

- The Wetland Seeding and Planting Stock Summary on page 70 only includes 4 tree species. For a forested wetland type, a minimum of 5-8 species should be planted to ensure adequate species diversity.

Response: Note 2 of the Wetland Seeding and Planting Stock Summary table specifies that a minimum of 5 species shall be selected for woody plantings. The table does not list each specific species of tree to be used, but rather denotes tree species by wetland indicator status type, as discussed in the National List of Plant Species that Occur in Wetlands report for the National Wetland Inventory. It states that for the red and white oak genus, along with the hickory genus, OBL, FACW, or FAC species are to be used in wetland mitigation. The specific species used will be determined by nursery availability at each annual planting. This plan is identical to recently approved plans including Amendment 4.

Offsite Mitigation Plan

- Peabody needs to clarify the portions of the offsite mitigation that would be protected. It is not clear if Peabody proposes to protect the entire parcels or only the wetland, stream, and upland buffer portions of each parcel.

Response: Restrictive Covenants will be placed on the wetlands, restored stream channels, and upland riparian buffers of each parcel owned by Peabody or its corporate affiliates following construction. Peabody will prepare a map outlining these areas. Negotiations are on-going for the uncontrolled portions of the planned off-site project, so final protection capability is not yet certain.

- The mitigation plan mirrors the onsite plan and includes only 4 species of trees. For a forested wetland type of plant community, a minimum of 5-8 species should be planted for adequate diversity.

Response: See response regarding number of tree species in on-site planting plan.

- On page 10 and 11, Peabody needs to include the riffle-pool ratio or number of these features to be installed on the stream. Further, the profile of Busseron Creek Mitigation Plan depicts several features with varying depths but does not identify which feature, riffles or pools.

On average, the Busseron Creek off-site stream mitigation plan incorporates approximately seven man-made riffle-pool structures per linear mile of restored stream. Additional riffle-pool structures will form naturally from in channel flow. Riffle and pools have been identified on the Busseron Creek mitigation plan profiles.

- Page 12 of the Busseron Creek Stream and Wetland Mitigation Plan, Peabody needs to revise the number of acres of PFO wetland from 90 acres to 135 acres.

The number of acres of PFO wetland has been changed from 90 acres to 135 acres in the Busseron Creek Stream and Wetland Mitigation Plan.

- The offsite mitigation plan does not specify buffer distance on the stream. Peabody needs to specify the buffer distance proposed on these mitigation streams.

No specific riparian buffer width is proposed in the mitigation plan due to construction occurring in a forested area. Access paths will be utilized through the mitigation sites and maintained along the mitigation during monitoring; however, pre disturbance forest will be replaced. For areas of stream creation, the stream alignment will be adjusted to limit the unnecessary removal of trees within the corridor to provide channel stability. Best Management Practices (BMPs) will be employed during project construction to minimize erosion. Erosion control will be performed locally throughout the site and will be incorporated during construction sequencing. Seeding with cover crop and permanent species as well as any deciduous supplemental plantings will be employed following construction.

Performance Standards

In general, the applicant needs to be more specific about the ecological performance standards to be achieved so that the success of both the onsite and offsite mitigation areas may be properly evaluated. These success criteria should be structured in a way that will demonstrate that post mining conditions will be similar to (when appropriate) or better than pre-mining conditions. Below is a list of USEPA's concerns based on information available.

- Under *Stream Success Criteria* on pages 73-74 of the 404 application, the selected USEPA Rapid Bioassessment Protocol metric goals appear to be low for "C" and "E" type streams. For example, the channel sinuosity metric performance goal for these types of streams is at the very low end of suboptimal which is generally not appropriate for these types of streams.

Response: The metric goals for the "C" and "E" types were approved for use and accepted on past Section 404 permits. In regards to sinuosity, the range of sinuosity listed in the habitat assessment worksheet for each condition category conflict with the Rosgen preferred stable sinuosity. The suboptimal condition reflects a sinuosity of 2 to 3. The stable sinuosity for a "C" Rosgen channel type is a sinuosity greater than 1.2, while for an "E" Rosgen channel type, a stable sinuosity is greater than 1.5.

- Performance standards are generally lacking for trees in wetland and riparian buffer areas. Ecologically based performance standards should include measurements such as diameter at breast height (1.4 meters) and basal coverage.

Response: Peabody has discussed this issue with forestry professionals in the past and is not aware of any reliable metric that predicts tree growth success. Considering all of the variable factors such as species, soil variations, weather variations and other natural factors, establishing strict standards that haven't been proven scientifically is not appropriate.

Wetlands

A minimum of 5 species will be selected from the Wetland Seeding and Planting Stock Summary table and no one species will make up more than 20% of the initial planting. Planting rates per acre will be 60 container trees or 600 bare root seedlings. Success will be determined by achieving 90% survival of container trees and 50% survival of bare root seedlings through appropriate tree counting techniques, where no one planted species makes up more than 25% of the surviving planted stock. Tree counting techniques may include one-fifth acre, twenty foot, or fifty foot radius circular plot. Due to the different hard mast tree species planted, growth rate may vary resulting in size variation at the end of monitoring. Therefore, trunk diameter at breast height and basal coverage will not be utilized as performance standards. The trees shall be well-established, growing, healthy, and indicative of a future hard-mast PFO1A wetland.

Riparian Buffers

A minimum of 5 species will be selected from the Forest/Wildlife Habitat for Stream Buffer Planting Stock Summary table where no one species will make up more than 20% of the initial planting. Planting rates per acre will be 60 container trees or 600 bare root seedlings. Success will be determined by achieving 90% survival of container trees and 80% survival of bare root seedlings through appropriate tree counting techniques, where no one planted species makes up more than 25% of the surviving planted stock. Tree counting techniques may include one-fifth acre, twenty foot, or fifty foot radius circular plot.

- Wetland areas should achieve 75% cover by native perennial hydrophytes and have less than 5% cover of invasive species.

Response: The proposed plan is identical to species lists in all recently approved Peabody 404 permits including Amendment 4. Also, please note all wetland mitigation in Amendment 5 is proposed to be forested wetlands.

Monitoring

- It is unclear why monitoring will not begin until seedlings are 30 inches high. These data should be collected beginning the first full growing season after construction to establish the baseline condition of the mitigation sites.

Response: Peabody agrees with this comment; however, it will be necessary to coordinate with the USACE, as they have insisted on this stipulation. Peabody also believes the monitoring period should be allowed to begin prior to the planting of all woody vegetation. Beginning monitoring when 75% is planted is practical. Access lanes are needed initially to complete maintenance or repairs and can be planted during the monitoring period.

- The monitoring section of the application beginning on page 76 indicates that monitoring will continue for up to 10 years. This should be revised to require that monitoring continue for at least 10 years, or until performance standards are achieved. Failure to show that the mitigation site is on a trajectory towards meeting performance standards or has achieved performance standards may extend monitoring time frame or require alternative mitigation.

Response: The statement on page 76 will be modified to the following: "Annual monitoring reports will be submitted to the USACE for a period of 10 years or until such time that performance standards are achieved and the USACE has granted release from monitoring."

- Peabody proposes to monitor wetland hydrology with wells, however no methodology or technical guidance document was provided. Peabody should provide the methodology for installing wells and criteria for monitoring hydrology on the mitigation sites.

Response: On page 73 of the permit narrative, the USACE Technical Standard for Water-Table Monitoring of Potential Wetland Sites (WRAP-05-2) is noted and referenced for the installation and monitoring of wetland hydrology. Page 76 describes for each wetland mitigation site adjacent to stream mitigation, a row of 3 groundwater table monitoring wells that will be installed equidistant between the top of stream bank and wetland/upland boundary.

- Peabody proposes to monitor biology at the bioassessment points, but does not indicate what the performance standard for biology or what the contingency measures would include if the streams do not meet the established goal. Peabody should update the monitoring plan to include biological performance standards. Further, they should develop contingency measures for failure to meet established levels.

Response: The following approved metric from the Bear Run Mine (Amendment 4) permit has been added to the permit narrative Section 4: Success Criteria:

"For macroinvertebrates, there will be a goal of no net loss of biological integrity compared to pre-mine assessments."

This states that post-mining aquatic health will be the equivalent or better than pre-mining ambient aquatic health. Metrics are often subjective and variable depending on sampling and site conditions and may not be replicatable even when conditions are the same.

Financial Assurances

The applicant has not offered financial assurances specifically for the stream and wetland mitigation onsite, and asserts that the SMCRA bond is sufficient to cover the cost of reclamation, including revegetation and maintenance, with no further detail provided. The mitigation plan must include more detailed information to satisfy the Mitigation Rule so as "to ensure a high level of confidence that the compensatory mitigation project will be successfully completed in accordance with its performance standards." One option may be to earmark a particular portion of the SMCRA bond to cover specific Section 404 mitigation construction and maintenance activities.

Response: Peabody believes financial assurance is unnecessary; however, it is willing to commit to not requesting final phase 3 bond release from the SMCRA regulatory authority for areas containing stream and wetland mitigation until granted release from monitoring by the USACE. This commitment is similar to the commitment in Amendment 4.